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to the natural progress of the disease, from the current level.

(Authority: 38 U.S.C. 1110 and 1131)

(c) *Cardiovascular disease.* Ischemic heart disease or other cardiovascular disease developing in a veteran who has a service-connected amputation of one lower extremity at or above the knee or service-connected amputations of both lower extremities at or above the ankles, shall be held to be the proximate result of the service-connected amputation or amputations.

(d) *Traumatic brain injury.* (1) In a veteran who has a service-connected traumatic brain injury, the following shall be held to be the proximate result of the service-connected traumatic brain injury (TBI), in the absence of clear evidence to the contrary:

(i) Parkinsonism, including Parkinson's disease, following moderate or severe TBI;

(ii) Unprovoked seizures following moderate or severe TBI;

(iii) Dementias of the following types: presenile dementia of the Alzheimer type, frontotemporal dementia, and dementia with Lewy bodies, if manifest within 15 years following moderate or severe TBI;

(iv) Depression if manifest within 3 years of moderate or severe TBI, or within 12 months of mild TBI; or

(v) Diseases of hormone deficiency that result from hypothalamo-pituitary changes if manifest within 12 months of moderate or severe TBI.

(2) Neither the severity levels nor the time limits in paragraph (d)(1) of this section preclude a finding of service connection for conditions shown by evidence to be proximately due to service-connected TBI. If a claim does not meet the requirements of paragraph (d)(1) with respect to the time of manifestation or the severity of the TBI, or both, VA will develop and decide the claim under generally applicable principles of service connection without regard to paragraph (d)(1).

(3)(i) For purposes of this section VA will use the following table for determining the severity of a TBI:

Mild	Moderate	Severe
Normal structural imaging LOC = 0–30 min	Normal or abnormal structural imaging ... LOC > 30 min and < 24 hours	Normal or abnormal structural imaging. LOC > 24 hrs.
AOC = a moment up to 24 hrs	AOC > 24 hours. Severity based on other criteria.	
PTA = 0–1 day GCS = 13–15	PTA > 1 and < 7 days GCS = 9–12	PTA > 7 days. GCS = 3–8.

NOTE: The factors considered are:

Structural imaging of the brain.

LOC—Loss of consciousness.

AOC—Alteration of consciousness/mental state.

PTA—Post-traumatic amnesia.

GCS—Glasgow Coma Scale. (For purposes of injury stratification, the Glasgow Coma Scale is measured at or after 24 hours.)

(ii) The determination of the severity level under this paragraph is based on the TBI symptoms at the time of injury or shortly thereafter, rather than the current level of functioning. VA will not require that the TBI meet all the criteria listed under a certain severity level in order to classify the TBI at that severity level. If a TBI meets the criteria in more than one category of severity, then VA will rank the TBI at the highest level in which a criterion is met, except where the qualifying criterion is the same at both levels.

(Authority: 38 U.S.C. 501, 1110 and 1131)

[44 FR 50340, Aug. 28, 1979, as amended at 66 FR 18198, Apr. 6, 2001; 71 FR 52747, Sept. 7, 2006; 78 FR 76208, Dec. 17, 2013]

§3.311 Claims based on exposure to ionizing radiation.

(a) *Determinations of exposure and dose*—(1) *Dose assessment.* In all claims in which it is established that a radiogenic disease first became manifest after service and was not manifest to a compensable degree within any applicable presumptive period as specified in §3.307 or §3.309, and it is contended the disease is a result of exposure to ionizing radiation in service, an assessment will be made as to the size

and nature of the radiation dose or doses. When dose estimates provided pursuant to paragraph (a)(2) of this section are reported as a range of doses to which a veteran may have been exposed, exposure at the highest level of the dose range reported will be presumed.

(Authority: 38 U.S.C. 501)

(2) *Request for dose information.* Where necessary pursuant to paragraph (a)(1) of this section, dose information will be requested as follows:

(i) *Atmospheric nuclear weapons test participation claims.* In claims based upon participation in atmospheric nuclear testing, dose data will in all cases be requested from the appropriate office of the Department of Defense.

(ii) *Hiroshima and Nagasaki occupation claims.* In all claims based on participation in the American occupation of Hiroshima or Nagasaki, Japan, prior to July 1, 1946, dose data will be requested from the Department of Defense.

(iii) *Other exposure claims.* In all other claims involving radiation exposure, a request will be made for any available records concerning the veteran's exposure to radiation. These records normally include but may not be limited to the veteran's Record of Occupational Exposure to Ionizing Radiation (DD Form 1141), if maintained, service medical records, and other records which may contain information pertaining to the veteran's radiation dose in service. All such records will be forwarded to the Under Secretary for Health, who will be responsible for preparation of a dose estimate, to the extent feasible, based on available methodologies.

(3) *Referral to independent expert.* When necessary to reconcile a material difference between an estimate of dose, from a credible source, submitted by or on behalf of a claimant, and dose data derived from official military records, the estimates and supporting documentation shall be referred to an independent expert, selected by the Director of the National Institutes of Health, who shall prepare a separate radiation dose estimate for consideration in adjudication of the claim. For purposes of this paragraph:

(i) The difference between the claimant's estimate and dose data derived from official military records shall ordinarily be considered material if one estimate is at least double the other estimate.

(ii) A dose estimate shall be considered from a ''credible source'' if prepared by a person or persons certified by an appropriate professional body in the field of health physics, nuclear medicine or radiology and if based on analysis of the facts and circumstances of the particular claim.

(4) *Exposure.* In cases described in paragraph (a)(2)(i) and (ii) of this section:

(i) If military records do not establish presence at or absence from a site at which exposure to radiation is claimed to have occurred, the veteran's presence at the site will be conceded.

(ii) Neither the veteran nor the veteran's survivors may be required to produce evidence substantiating exposure if the information in the veteran's service records or other records maintained by the Department of Defense is consistent with the claim that the veteran was present where and when the claimed exposure occurred.

(b) *Initial review of claims.* (1) When it is determined:

(i) A veteran was exposed to ionizing radiation as a result of participation in the atmospheric testing of nuclear weapons, the occupation of Hiroshima or Nagasaki, Japan, from September 1945 until July 1946, or other activities as claimed;

(ii) The veteran subsequently developed a radiogenic disease; and

(iii) Such disease first became manifest within the period specified in paragraph (b)(5) of this section; before its adjudication the claim will be referred to the Under Secretary for Benefits for further consideration in accordance with paragraph (c) of this section. If any of the foregoing 3 requirements has not been met, it shall not be determined that a disease has resulted from exposure to ionizing radiation under such circumstances.

(2) For purposes of this section the term ''radiogenic disease'' means a disease that may be induced by ionizing radiation and shall include the following:

(i) All forms of leukemia except chronic lymphatic (lymphocytic) leukemia;
(ii) Thyroid cancer;
(iii) Breast cancer;
(iv) Lung cancer;
(v) Bone cancer;
(vi) Liver cancer;
(vii) Skin cancer;
(viii) Esophageal cancer;
(ix) Stomach cancer;
(x) Colon cancer;
(xi) Pancreatic cancer;
(xii) Kidney cancer;
(xiii) Urinary bladder cancer;
(xiv) Salivary gland cancer;
(xv) Multiple myeloma;
(xvi) Posterior subcapsular cataracts;
(xvii) Non-malignant thyroid nodular disease;
(xviii) Ovarian cancer;
(xix) Parathyroid adenoma;
(xx) Tumors of the brain and central nervous system;
(xxi) Cancer of the rectum;
(xxii) Lymphomas other than Hodgkin's disease;
(xxiii) Prostate cancer; and
(xxiv) Any other cancer.

(Authority: 38 U.S.C. 501)

(3) Public Law 98–542 requires VA to determine whether sound medical and scientific evidence supports establishing a rule identifying polycythemia vera as a radiogenic disease. VA has determined that sound medical and scientific evidence does not support including polycythemia vera on the list of known radiogenic diseases in this regulation. Even so, VA will consider a claim based on the assertion that polycythemia vera is a radiogenic disease under the provisions of paragraph (b)(4) of this section.

(Authority: Pub. L. 98–542, section 5(b)(2)(A)(i), (iii)).

(4) If a claim is based on a disease other than one of those listed in paragraph (b)(2) of this section, VA shall nevertheless consider the claim under the provisions of this section provided that the claimant has cited or submitted competent scientific or medical evidence that the claimed condition is a radiogenic disease.

(5) For the purposes of paragraph (b)(1) of this section:

(i) Bone cancer must become manifest within 30 years after exposure;
(ii) Leukemia may become manifest at any time after exposure;
(iii) Posterior subcapsular cataracts must become manifest 6 months or more after exposure; and
(iv) Other diseases specified in paragraph (b)(2) of this section must become manifest 5 years or more after exposure.

(Authority: 38 U.S.C. 501; Pub. L. 98–542)

(c) *Review by Under Secretary for Benefits.* (1) When a claim is forwarded for review pursuant to paragraph (b)(1) of this section, the Under Secretary for Benefits shall consider the claim with reference to the factors specified in paragraph (e) of this section and may request an advisory medical opinion from the Under Secretary for Health.

(i) If after such consideration the Under Secretary for Benefits is convinced sound scientific and medical evidence supports the conclusion it is at least as likely as not the veteran's disease resulted from exposure to radiation in service, the Under Secretary for Benefits shall so inform the regional office of jurisdiction in writing. The Under Secretary for Benefits shall set forth the rationale for this conclusion, including an evaluation of the claim under the applicable factors specified in paragraph (e) of this section.

(ii) If the Under Secretary for Benefits determines there is no reasonable possibility that the veteran's disease resulted from radiation exposure in service, the Under Secretary for Benefits shall so inform the regional office of jurisidiction in writing, setting forth the rationale for this conclusion.

(2) If the Under Secretary for Benefits, after considering any opinion of the Under Secretary for Health, is unable to conclude whether it is at least as likely as not, or that there is no reasonable possibility, the veteran's disease resulted from radiation exposure in service, the Under Secretary for Benefits shall refer the matter to an outside consultant in accordance with paragraph (d) of this section.

(3) For purposes of paragraph (c)(1) of this section, ''sound scientific evidence'' means observations, findings,

or conclusions which are statistically and epidemiologically valid, are statistically significant, are capable of replication, and withstand peer review, and ''sound medical evidence'' means observations, findings, or conclusions which are consistent with current medical knowledge and are so reasonable and logical as to serve as the basis of management of a medical condition.

(d) *Referral to outside consultants.* (1) Referrals pursuant to paragraph (c) of this section shall be to consultants selected by the Under Secretary for Health from outside VA, upon the recommendation of the Director of the National Cancer Institute. The consultant will be asked to evaluate the claim and provide an opinion as to the likelihood the disease is a result of exposure as claimed.

(2) The request for opinion shall be in writing and shall include a description of:

(i) The disease, including the specific cell type and stage, if known, and when the disease first became manifest;

(ii) The circumstances, including date, of the veteran's exposure;

(iii) The veteran's age, gender, and pertinent family history;

(iv) The veteran's history of exposure to known carcinogens, occupationally or otherwise;

(v) Evidence of any other effects radiation exposure may have had on the veteran; and

(vi) Any other information relevant to determination of causation of the veteran's disease.

The Under Secretary for Benefits shall forward, with the request, copies of pertinent medical records and, where available, dose assessments from official sources, from credible sources as defined in paragraph (a)(3)(ii) of this section, and from an independent expert pursuant to paragraph (a)(3) of this section.

(3) The consultant shall evaluate the claim under the factors specified in paragraph (e) of this section and respond in writing, stating whether it is either likely, unlikely, or approximately as likely as not the veteran's disease resulted from exposure to ionizing radiation in service. The response shall set forth the rationale for the consultant's conclusion, including the consultant's evaluation under the applicable factors specified in paragraph (e) of this section. The Under Secretary for Benefits shall review the consultant's response and transmit it with any comments to the regional office of jurisdiction for use in adjudication of the claim.

(e) *Factors for consideration.* Factors to be considered in determining whether a veteran's disease resulted from exposure to ionizing radiation in service include:

(1) The probable dose, in terms of dose type, rate and duration as a factor in inducing the disease, taking into account any known limitations in the dosimetry devices employed in its measurement or the methodologies employed in its estimation;

(2) The relative sensitivity of the involved tissue to induction, by ionizing radiation, of the specific pathology;

(3) The veteran's gender and pertinent family history;

(4) The veteran's age at time of exposure;

(5) The time-lapse between exposure and onset of the disease; and

(6) The extent to which exposure to radiation, or other carcinogens, outside of service may have contributed to development of the disease.

(f) *Adjudication of claim.* The determination of service connection will be made under the generally applicable provisions of this part, giving due consideration to all evidence of record, including any opinion provided by the Under Secretary for Health or an outside consultant, and to the evaluations published pursuant to §1.17 of this title. With regard to any issue material to consideration of a claim, the provisions of §3.102 of this title apply.

(g) *Willful misconduct and supervening cause.* In no case will service connection be established if the disease is due to the veteran's own willful misconduct, or if there is affirmative evidence to establish that a supervening,

nonservice-related condition or event is more likely the cause of the disease.

(Authority: Pub. L. 98–542)

[50 FR 34459, Aug. 26, 1985, as amended at 54 FR 42803, Oct. 18, 1989; 58 FR 16359, Mar. 26, 1993. Redesignated at 59 FR 5107, Feb. 3, 1994, and amended at 59 FR 45975, Sept. 6, 1994; 60 FR 9628, Feb. 21, 1995; 60 FR 53277, Oct. 13, 1995; 63 FR 50994, Sept. 24, 1998; 67 FR 6871, Feb. 14, 2002]

§ 3.312 Cause of death.

(a) *General.* The death of a veteran will be considered as having been due to a service-connected disability when the evidence establishes that such disability was either the principal or a contributory cause of death. The issue involved will be determined by exercise of sound judgment, without recourse to speculation, after a careful analysis has been made of all the facts and circumstances surrounding the death of the veteran, including, particularly, autopsy reports.

(b) *Principal cause of death.* The service-connected disability will be considered as the principal (primary) cause of death when such disability, singly or jointly with some other condition, was the immediate or underlying cause of death or was etiologically related thereto.

(c) *Contributory cause of death.* (1) Contributory cause of death is inherently one not related to the principal cause. In determining whether the service-connected disability contributed to death, it must be shown that it contributed substantially or materially; that it combined to cause death; that it aided or lent assistance to the production of death. It is not sufficient to show that it casually shared in producing death, but rather it must be shown that there was a causal connection.

(2) Generally, minor service-connected disabilities, particularly those of a static nature or not materially affecting a vital organ, would not be held to have contributed to death primarily due to unrelated disability. In the same category there would be included service-connected disease or injuries of any evaluation (even though evaluated as 100 percent disabling) but of a quiescent or static nature involving muscular or skeletal functions and not materially affecting other vital body functions.

(3) Service-connected diseases or injuries involving active processes affecting vital organs should receive careful consideration as a contributory cause of death, the primary cause being unrelated, from the viewpoint of whether there were resulting debilitating effects and general impairment of health to an extent that would render the person materially less capable of resisting the effects of other disease or injury primarily causing death. Where the service-connected condition affects vital organs as distinguished from muscular or skeletal functions and is evaluated as 100 percent disabling, debilitation may be assumed.

(4) There are primary causes of death which by their very nature are so overwhelming that eventual death can be anticipated irrespective of coexisting conditions, but, even in such cases, there is for consideration whether there may be a reasonable basis for holding that a service-connected condition was of such severity as to have a material influence in accelerating death. In this situation, however, it would not generally be reasonable to hold that a service-connected condition accelerated death unless such condition affected a vital organ and was of itself of a progressive or debilitating nature.

CROSS REFERENCES: Reasonable doubt. See § 3.102. Service connection for mental unsoundness in suicide. See § 3.302.

[26 FR 1582, Feb. 24, 1961, as amended at 54 FR 34981, Aug. 23, 1989; 54 FR 42803, Oct. 18, 1989]

§ 3.313 Claims based on service in Vietnam.

(a) *Service in Vietnam. Service in Vietnam* includes service in the waters offshore, or service in other locations if the conditions of service involved duty or visitation in Vietnam.

(b) *Service connection based on service in Vietnam.* Service in Vietnam during the Vietnam Era together with the development of non-Hodgkin's lymphoma manifested subsequent to such service